

CLAIMS

WHAT IS CLAIMED IS:

1. A seal pad comprising:
 - a base plate;
 - an expandable material engaged with the base plate, the expandable material comprising an outer surface, a portion of the outer surface being suitable for sealing against a borehole wall and a portion of the outer surface being expanded during the sealing against the borehole wall; and
 - a retainer suitable for controlling the expansion of the expandable material, the retainer engaging at least a portion of the outer surface of the expandable material when sealed against the borehole wall.
2. The seal pad of claim 1 where the retainer engages the entire perimeter of the expandable material when sealed against the borehole wall.
3. The seal pad of claim 1 where the retainer further comprises an expansion cavity, at least a portion of the expandable material being expanded into the cavity when sealed against the borehole wall.
4. The seal pad of claim 3 where the expansion cavity is located around the entire perimeter of the expandable material.
5. The seal pad of claim 1 where the retainer is integrated with the base plate.
6. The seal pad of claim 5 where the retainer comprises a rib on at least a portion of the base plate.
7. The seal pad of claim 1 where the retainer comprises a surface around the entire perimeter of the expandable material.

8. The seal pad of claim 1 where the retainer is suitable for controlling expansion of at least a portion of the expandable material in the lateral direction.
9. The seal pad of claim 1 where the retainer is suitable for controlling expansion of the entire perimeter of the expandable material in the lateral direction.
10. The seal pad of claim 1 where the expandable material comprises an elastomeric material.
11. The seal pad of claim 1 where the expandable material comprises rubber.
12. The seal pad of claim 1 where the expandable material comprises Teflon.
13. A method of forming a seal against a borehole wall comprising:

sealingly engaging a portion of an expandable material outer surface against the borehole wall, the expandable material engaging a base plate and at least a portion of the expandable material expanding during engagement of the borehole wall; and

controlling the expansion of the expandable material with a retainer engaging at least a portion of the outer surface of the expandable material when sealed against the borehole wall.
14. The method of claim 13 further comprising engaging the entire perimeter of the expandable material when sealed against the borehole wall with the retainer.
15. The method of claim 13 further comprising expanding at least a portion of the expandable material into a retainer expansion cavity when engaging the borehole wall.
16. The method of claim 15 further comprising expanding the expandable material into the expansion cavity around the entire perimeter of the expandable material.
17. The method of claim 13 further comprising controlling the expansion of the expandable

material around the entire perimeter of the expandable material with the retainer.

18. The method of claim 13 further comprising controlling the expansion of at least a portion of the expandable material in the lateral direction.

19. A formation tester comprising:

a body;

an extendable test probe assembly comprising:

a seal pad comprising:

a base plate;

an expandable material engaged with the base plate, the expandable material comprising an outer surface, a portion of the outer surface being suitable for sealing against a formation borehole wall and a portion of the outer surface being expanded during the sealing against the borehole wall; and

a retainer suitable for controlling the expansion of the expandable material, the retainer engaging at least a portion of the outer surface of the expandable material when sealed against the borehole wall; and

a bore through the base plate and seal pad; and

a cylinder comprising a flow path in fluid communication with the formation through the seal pad bore;

a fluid sample collection reservoir in fluid communication with the test probe cylinder flow path; and

a fluid transfer device suitable for transferring formation fluid through the test probe cylinder flow path and into the fluid sample collection chamber.

20. The formation tester of claim 19 where the seal pad retainer engages the entire perimeter of the expandable material when sealed against the borehole wall.

21. The formation tester of claim 19 where the seal pad retainer further comprises an expansion

cavity, at least a portion of the expandable material being expanded into the cavity when sealed against the borehole wall.

22. The formation tester of claim 21 where the seal pad expansion cavity is located around the entire perimeter of the expandable material.

23. The formation tester of claim 19 where the seal pad retainer is integrated with the base plate.

24. The formation tester of claim 23 where the seal pad retainer comprises a rib on at least a portion of the base plate.

25. The formation tester of claim 19 where the seal pad retainer comprises a surface around the entire perimeter of the expandable material.

26. The formation tester of claim 19 where the seal pad retainer is suitable for controlling expansion of at least a portion of the expandable material in the lateral direction.

27. The formation tester of claim 19 where the seal pad retainer is suitable for controlling expansion of the entire perimeter of the expandable material in the lateral direction.

28. The formation tester of claim 19 where the seal pad expandable material comprises an elastomeric material.

29. The formation tester of claim 19 where the seal pad expandable material comprises rubber.

30. The formation tester of claim 19 where the seal pad expandable material comprises Teflon.

31. The formation tester of claim 19 further comprising a sensor for sensing a characteristic of the formation fluid sample.

32. The formation tester of claim 19 where the body is suitable for being lowered into a borehole on a wireline.

33. The formation tester of claim 19 where the body is suitable for being lowered into a borehole on a drill string.

34. The formation tester of claim 19 where the fluid transfer device comprises a fluid pump.

35. A method for collecting a formation fluid sample comprising:

inserting a formation tester into a borehole, the formation tester comprising a body;

extending an extendable test probe assembly from the body into sealing contact with the borehole wall, the test probe assembly forming the seal with a portion of an expandable material outer surface, the expandable material engaging a base plate and at least a portion of the expandable material expanding during engagement of the borehole wall;

controlling the expansion of the expandable material with a retainer engaging at least a portion of the outer surface of the expandable material when sealed against the borehole wall;

collecting a formation fluid sample through a test probe assembly cylinder in fluid contact with the formation through a bore in the seal pad, the test probe assembly cylinder comprising a flow path;

transferring the formation fluid sample with a fluid transfer device from the test probe assembly cylinder to a fluid sample collection chamber.

36. The method of claim 35 further comprising engaging the entire perimeter of the expandable material when sealed against the borehole wall with the retainer.

37. The method of claim 35 further comprising expanding at least a portion of the expandable material into a retainer expansion cavity when engaging the borehole wall.

38. The method of claim 37 further comprising expanding the expandable material into the expansion cavity around the entire perimeter of the expandable material.
39. The method of claim 35 further comprising controlling the expansion of the expandable material around the entire perimeter of the expandable material with the retainer.
40. The method of claim 35 further comprising controlling the expansion of at least a portion of the expandable material in the lateral direction.
41. The method of claim 35 further comprising analyzing the formation sample for a characteristic of the formation fluid with a sensor.
42. The method of claim 35 further comprising inserting the formation tester into the borehole on a drill string while drilling the borehole.
43. The method of claim 42 further comprising ceasing the drilling while collecting the formation fluid sample, withdrawing the extendable test probe assembly into the formation tester body, and continuing to drill the borehole.
44. The method of claim 35 further comprising inserting the formation tester into the borehole on a wireline tool.
45. The method of claim 35 further comprising transmitting a signal indicating the sensed formation fluid characteristic through a telemetry system to the surface.